

Listing of the Claims:

1. (Previously presented) A bipolar battery cell comprising:
a plurality of electric cells, each electric cell comprising:
a bipolar electrode including a collector having a positive-electrode layer on one surface and a negative-electrode layer on an opposing surface;
an electrolyte layer that exchanges ions between the positive-electrode layer and the negative electrode layer; and
a discharge circuit printed on one or more of the positive-electrode layer, the negative electrode layer and electrolyte layer within each electric cell, the discharge circuit configured within each bipolar electrode to electrically balance charged conditions of adjacent electric cells.
2. (Canceled).
3. (Previously presented) The bipolar battery cell of claim 1, further comprising a contact area between the discharge circuit and an adjacent bipolar electrode that is more than 0.06 mm^2 per battery capacity of the bipolar battery 1 Ah.
4. (Previously presented) The bipolar battery cell of claim 1, wherein a threshold of a discharge voltage in the discharge circuit is set between 3.6 V – 4.1 V, and wherein a doping concentration is set between $10^{17} - 10^{18} \text{ cm}^{-3}$, and the thickness of a depletion layer is set between $0.1 \text{ }\mu\text{m} - 1.0 \text{ }\mu\text{m}$ so as to set a breakdown voltage of a PN junction of the discharge circuit the same as to the threshold.
5. (Original) The bipolar battery cell of claim 1, wherein the discharge circuit includes a zener diode layer.
6. (Original) The bipolar battery cell of claim 1, wherein the discharge circuit includes a luminescent device.

7. (Original) The bipolar battery cell of claim 6, further comprising a light guiding device arranged between the luminescent device and an end of the battery cell.

8. (Original) The bipolar battery cell of claim 6, further comprising a light sensor that responds to light emitted from the relevant luminescent device.

9. (Original) The bipolar battery cell of claim 8, wherein the discharge circuit includes a constant current circuit.

10. (Original) The bipolar battery cell of claim 9, further comprising a sheathing material that covers and seals the bipolar electrodes, the electrolyte layers, the discharge circuit, and the light sensor.

11. (Original) The bipolar battery cell of claim 1, further comprising a sheathing material that covers and seals the bipolar electrodes, the electrolyte layers, and the discharge circuit.

12. (Original) The bipolar battery cell of claim 1, further comprising a conductive sealing material.

13. (Previously presented) An assembled battery comprising a plurality of bipolar battery cells, wherein each bipolar battery cell comprises a plurality of electric cells, each electric cell comprising:

a laminated bipolar electrode including a collector having a positive-electrode layer on one surface and a negative-electrode layer on an opposing surface;

an electrolyte layer that exchanges ions between the positive-electrode layer and the negative electrode layer; and

a discharge circuit printed on one or more of the positive-electrode layer,

the negative electrode layer and electrolyte layer that electrically balances charged conditions of adjacent bipolar electrodes.

14. (Previously presented) A vehicle comprising:

a controller; and

an assembled bipolar battery comprising a plurality of bipolar battery cells, wherein each bipolar battery cell comprises a plurality of electric cells, each electric cell comprising:

a bipolar electrode including a collector having a positive-electrode layer on one surface and a negative-electrode layer on an opposing surface;

an electrolyte layer that exchanges ions between the positive-electrode layer and the negative electrode layer; and

a discharge circuit printed on one or more of the positive-electrode layer, the negative electrode layer and electrolyte layer that electrically balances charged conditions of adjacent bipolar electrodes.

15. (Previously presented) A method of forming a bipolar battery cell, each bipolar battery cell comprising a plurality of electric cells, the method comprising:

laminating a bipolar electrode including a collector having a positive-electrode layer on one surface and a negative-electrode layer on an opposing surface, with an electrolyte layer that exchanges ions between the positive-electrode layer and the negative electrode layer and a discharge circuit printed on one or more of the positive-electrode layer, the negative electrode layer and electrolyte layer that electrically balances charged conditions of adjacent bipolar electrodes to form each electric cell of the plurality of electric cells.

16. (Canceled).

17. (Previously presented) A bipolar battery cell comprising:

a plurality of electric cells, each electric cell comprising:

a bipolar electrode including a collector having a positive-electrode layer on one surface and a negative-electrode layer on an opposing surface;

means for exchanging ions between the positive-electrode layer and the negative electrode layer; and

means for balancing the bipolar battery cell by electrically balancing charged conditions of adjacent bipolar electrodes, the means for balancing located on one or more of the positive-electrode layer, the negative electrode layer and electrolyte layer.

18. (Previously presented) The bipolar battery cell of claim 1, wherein the discharge circuit comprises an abnormal voltage detecting circuit and a voltage balancing circuit.

19. (Previously presented) The bipolar battery cell of claim 1, wherein each electric cell further comprises conductive bodies printed on each of the positive-electrode layer, the negative electrode layer and electrolyte layer, wherein the discharge circuit is located directly between two conductive bodies.

20. (Previously presented) The bipolar battery cell of claim 1, wherein the conductive bodies located on each of the positive-electrode layer, the negative electrode layer and electrolyte layer are positioned such that the conductive bodies electrically conduct with adjacent conductive bodies.